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Substitute for form 1449A/PTO

## INFORMATION DISCLOSURE STATEMENT BY APPLICANT

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Sheet 1 of 6

### Complete if Known

Application Number	09/879,959
Filing Date	06/13/2001
First Named Inventor	Paul H. Weigel, et al.
Group Art Unit	1653
Examiner Name	G. Boguskiy <i>R. Weigel</i>
Attorney Docket Number	35541.049

### U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No. <sup>1</sup>	U.S. Patent Document		Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYYY	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number	Kind Code <sup>2</sup> (if known)			
	1	<del>4169888</del>		<del>Hardman et al.</del>	<del>10/02/1978</del>	
<i>MP</i>	2	4224179		Schneider	09/23/1980	
<i>MP</i>	3	4235871		Papahadjopoulos, et al.	11/25/1980	
<i>MP</i>	4	4511478		Nowinski, et al.	04/16/1985	
<i>MP</i>	5	4517295		Bracke, et al.	05/14/1985	
	6	<del>4615697</del>		<del>Robinson</del>	<del>10/07/1986</del>	
<i>MP</i>	7	4708861		Popescu, et al.	11/24/1987	
	8	4780414		Nimrod, et al.	10/25/1988	
	9	4782046		Brown, et al.	11/01/1988	
	10	4784990		Nimrod, et al.	11/15/1988	
<i>MP</i>	11	4801539		Akasaka, et al.	01/31/1989	
	12	<del>4822867</del>		<del>Erman</del>	<del>04/16/1989</del>	
<i>MP</i>	13	4885244		Miyamori et al.	12/05/1989	
	14	<del>4889302</del>		<del>Robinson</del>	<del>01/08/1991</del>	
<i>MP</i>	15	5015577		Weigel, et al.	05/14/1991	
<i>MP</i>	16	5023175		Hosoya, et al.	06/11/1991	
<i>MP</i>	17	5071751		Morita, et al.	10/12/1991	
	18	<del>5171680</del>		<del>Kawaguchi, et al.</del>	<del>12/15/1992</del>	
	19	<del>5247743</del>		<del>Parash</del>	<del>06/08/1993</del>	
	20	<del>5337747</del>		<del>Neftel</del>	<del>08/16/1994</del>	

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		Office <sup>3</sup>	Number <sup>4</sup>	Kind Code <sup>5</sup> (if known)				
<i>MP</i>	A		0036776	EPO	Kleid, et al.	05/11/1988		
	B		0144019	EPO	Brown, et al.	06/13/1990		
	C		0195303	EPO	Grandi, et al.	11/08/1989		
	D		0244757	EPO	Hosoya, et al.	11/09/1994		
	E		0266578	EPO	Miyamori, et al.	07/07/1993		
	F		91/03559	WO	Weigel, et al.	03/21/1991		
	G		94/00463	WO	Prehm, et al.	01/06/1994		
<i>MP</i>	H		95/24497	WO	Lansing, et al.	09/14/1995		
	I		95/33067	WO	Stohl, Sten	12/07/1995		
<i>MP</i>	J		97/20061	WO	Wong, et al.	06/05/1997		

Examiner Signature

*[Signature]*

Date Considered

6/3/04

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<b>Examiner Name</b>	G. Bugaisky <i>R. Way</i>
<b>Attorney Docket Number</b>	35541.049

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		Office <sup>3</sup>	Number <sup>4</sup>				
—	K		8-38338 JP		1996		
—	L		4-124854 JP		1992		
—	M		4-134854 JP		1992		
—	N		61-267468 JP		1986		
—	O		4-80202		03/13/1992		
MM	P		63094988 JP	Seitogaku <sup>Maji</sup> Jyogaku	1988		
mm	Q		62032893 JP	Kyowa	1987		
MM	R		4-158796 JP	Chisso Corp.	1992		
mm	S		2249315 GB	Satch, et al.	05/06/1992		

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## INFORMATION DISCLOSURE STATEMENT BY APPLICANT

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Sheet 3 of 6

### Compleat if Known

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Filing Date	06/13/2001
First Named Inventor	Paul H. Weigel, et al.
Group Art Unit	1653
Examiner Name	G. Ruggiero R. Wex
Attorney Docket Number	35541.049

### OTHER PRIOR ART - NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T <sup>2</sup>
MPW	AA	"THE PRODUCTION OF CAPSULES, HYALURONIC ACID AND HYALURONIDASE BY GROUP A AND GROUP C STREPTOCOCCI", MacLennan, J. Gen. Microbiol., 14:134-142 (1956).	
MPW	BB	"THE ISOLATION AND CHARACTERIZATION OF A HYALURONIDASE PRODUCED BY A CAPSULATED STRAIN OF GROUP C STREPTOCOCCUS", MacLennan, J. Gen. Microbiol., 14:143-152 (1956).	
MPW	CC	"THE BIOSYNTHESIS OF HYALURONIC ACID BY GROUP A STREPTOCOCCUS", Markovitz et al., J. Biol. Chem., 234 (9):2343-2350 (1959).	
MPW	DD	"THE BIOSYNTHESIS OF HYALURONIC ACID BY STREPTOCOCCUS," Stoolmiller, et al., Journal of Biological Chemistry, Vol. 244, No. 2, pp. 236-246 (1969).	
MPW	EE	"THE ISOLATION AND CHARACTERIZATION OF HYALURONIC ACID FROM PASTEURELLA MULTOCIDA", Cifonelli, et al., Carbohydrate Research, 14, 272-276, (1970).	
MPW	FF	"BIOSYNTHESIS OF HYALURONIC ACID BY STREPTOCOCCUS", Sugahara et al., J. Biol. Chem., 254:6252-6261 (1979).	
MPW	GG	"MODERN GENETICS," Ayala, et al., Benjamin/Cummings Publishing Col., Menlo Park CA, p. 45 (1980).	
MPW	HH	"HYALURONIDASE PRODUCTION BY TYPE B PASTEURELLA MULTOCIDA FROM CASES OF HEMORRHAGIC SEPTICEMIA", Carter, et al., Journal of Clinical Microbiology, p. 94-96, (1980).	
MPW	II	"STRAINS OF ESCHERICHIA COLI CARRYING THE STRUCTURAL GENE FOR HISTIDYL-IRNA SYNTHETASE ON A HIGH COPY-NUMBER PLASMID," Eisenbeis, et al., Mol. Gen. Genet. 183:115-122 (1981).	
MPW	JJ	"SYNTHESIS OF HYALURONATE IN DIFFERENTIATED TERATOCARCINOMA CELLS," Prehm, et al., J. Biochem, Vol. 211, pp. 181-189 (1983).	
MPW	KK	"STREPTOCOCCAL HYALURONIC ACID: PROPOSED MECHANISMS OF DEGRADATION AND LOSS OF SYNTHESIS DURING STATIONARY PHASE", Van de Rijn, J. Bacteriol., 156(3):1059-1065 (1983).	

Examiner Signature	<i>[Signature]</i>	Date Considered	6/13/04
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		First Named Inventor	Paul H. Weigel, et al.
		Group Art Unit	1653
		Examiner Name	C. Bussick / Wey
		Attorney Docket Number	35541.049
Sheet	4	of	6

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MPW	LL	"SOLUBILIZATION OF HYALURONIC ACID SYNTHETIC ACTIVITY FROM STREPTOCOCCI AND ITS ACTIVATION WITH PHOSPHOLIPIDS", Triscott et al., J. Biol. Chem., 261(13):6004-6009 (1986).	
MPW	MM	"ISOLATION OF STREPTOCOCCAL HYALURONATE SYNTHASE", Prehm et al., Biochem. J., 235:887-889 (1986).	
MPW	NN	"ISOLATION, STRUCTURE AND EXPRESSION OF MAMMALIAN GENES FOR HISTIDYL-tRNA SYNTHETASE," Tsui, et al., Nucleic Acids Research, Vol. 15, No. 8, pp. 3349-3367, (1987).	
MPW	OO	"SHUTTLE VECTORS CONTAINING A MULTIPLE CLONING SITE AND A LACZA GENE FOR CONJUGAL TRANSFER OF DNA FROM ESCHERICHIA COLI TO GRAM-POSITIVE BACTERIA," Trieu-Cout, et al., Gene, Vol. 102, pp. 99-104, (1991).	
MPW	PP	"ANALYSIS OF THE STREPTOCOCCAL HYALURONIC ACID SYNTHASE COMPLEX USING THE PHOTOAFFINITY PROBE 5-AZIDO-UDP-GLUCURONIC ACID," Van de Rijn, et al., J. Biol. Chem., Vol. 267, No. 34, pp. 24302-24306, (1992).	
MPW	QQ	"MOLECULAR CHARACTERIZATION OF A LOCUS REQUIRED FOR HYALURONIC ACID CAPSULE PRODUCTION IN GROUP A STREPTOCOCCI," Dougherty, et al., J. Exp. Med., Vol. 175, pp. 1291-1299, (1992).	
MPW	RR	"HYALURONAN," Laurent, et al., FASEB Journal, Vol. 6, pp. 2397-2404, (1992).	
MPW	SS	"HYALURONIC ACID AND A (1-4)-B-D-XYLAN, EXTRACELLULAR POLYSACCHARIDES OF PASTEURELLA MULTOCIDA (CARTER TYPE A) STRAIN 880", Rosner, et al., Carbohydrate Research, 223, 329-333 (1992).	
MPW	TT	"ISOLATION OF A STREPTOCOCCUS PYOGENES GENE LOCUS THAT DIRECTS HYALURONAN BIOSYNTHESIS IN ACAPSULAR MUTANTS AND IN HETEROLOGOUS BACTERIA," DeAngelis, et al., J. Biol. Chem., Vol. 268, No. 20, pp. 14568-14571, (1993).	
MPW	UU	"HYALURONATE SYNTHASE: CLONING AND SEQUENCING OF THE GENE FROM STREPTOCOCCUS SP.," Lansing, et al., J. Biochem., Vol. 289, pp. 179-184, (1993).	
MPW	VV	"MOLECULAR CHARACTERIZATION OF HASB FROM AN OPERON REQUIRED FOR HYALURONIC ACID SYNTHESIS IN GROUP A STREPTOCOCCI," Dougherty, et al., J. Biol. Chem., Vol. 268, No. 10, pp. 7118-7124, (1993).	

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Sheet 5 of 6

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Application Number	09/879,959
Filing Date	06/13/2001
First Named Inventor	Paul H. Weigel, et al.
Group Art Unit	1653
Examiner Name	G. Bugaisky R. Way
Attorney Docket Number	35541.049

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MP	WW	"MOLECULAR CLONING, IDENTIFICATION, AND SEQUENCE OF THE HYALURONAN SYNTHASE GENE FROM GROUP A STREPTOCOCCUS PYOGENES," DeAngelis, et al., J. Biol. Chem., Vol. 268, No. 26, pp. 19181-19184, (1993).	
MP	XX	"CAPSULAR HYALURONIC ACID IN PASTEURELLA MULTOCIDA TYPE A AND ITS COUNTERPART IN TYPE D", Pandit, Research in Veterinary Science 54, 20-24 (1993).	
MP	YY	"MOLECULAR CHARACTERIZATION OF HASA FROM AN OPERON REQUIRED FOR HYALURONIC ACID SYNTHESIS IN GROUP A STREPTOCOCCI," Dougherty, et al., J. Biol. Chem., Vol. 269, No. 1, pp. 169-175.	
MP	ZZ	"THE STREPTOCOCCUS PYOGENES HYALURONAN SYNTHASE: SEQUENCE COMPARISON AND CONSERVATION AMONG VARIOUS GROUP A STRAINS," DeAngelis, et al., Biochem. and Biophys. Res. Comm., Vol. 199, No. 1, pp. 1-10, (1994).	
MP	aa	"HYALURONIDASE AND CHONDROITINASE ACTIVITY OF PASTEURELLA MULTOCIDA SEROTYPE B:2 INVOLVED IN HAEMORRHAGIC SEPTICAEMIA", Rimler, et al., Veterinary Record 134, 67-68 (1994).	
MP	bb	"MOLECULAR FINGERPRINTING OF PASTEURELLA MULTOCIDA ASSOCIATED WITH PROGRESSIVE ATROPHIC RHINITIS IN SWINE HERDS". Gardner et al. Database Medline on Dialog, US Natl. Library of Medicine (Bethesda, MD, USA) No. 95161494, Abstract, J. Vet. Diagn. Invest. Oct. 1994. Vol. 6, No. 4 pages	
MP	cc	"THE ELUCIDATION OF NOVEL CAPSULAR GENOTYPES OF HAEMOPHILUS INFLUENZAE TYPE B WITH THE POLYMERASE CHAIN REACTION. Leaves et al. J. Medical Microbiology. 1995, Vol. 43, pages 120-124, entire document.	
MP	dd	"CAPSULAR HYALURONIC ACID-MEDIATED ADHESION OF PASTEURELLA MULTOCIDA TO TURKEY AIR SAC MACROPHAGES", Pruimboom, et al., Avian Diseases 40:887-893, (1996).	
MP	ee	"HOMOLOGS OF THE XENOPUS DEVELOPMENTAL GENE DG42 ARE PRESENT IN ZEBRAFISH AND MOUSE AND ARE INVOLVED IN THE SYNTHESIS OF NOD-LIKE CHITIN OLIGOSACCHARIDES DURING EARLY EMBRYOGENESIS", Semino et al., Proc. Natl Acad. Sci. USA, 93:4548-4553 (1996).	
MP	ff	"ENZYMOLOGICAL CHARACTERIZATION OF THE PASTEURELLA MULTOCIDA HYALURONIC ACID SYNTHASE", DeAngelis, Biochemistry, 35 (30): 9768-9771 (1996).	
MP	gg	"CONSTRUCTION AND CHARACTERIZATION OF A POTENTIAL LIVE ORAL CARRIER-BASED VACCINE AGAINST VIBRIO CHOLERAEE". Favre et al. Infection and Immunity. September 1996. Vol. 64, No. 9 pages 3565-3570, entire document.	

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dw	hh	"MOLECULAR CLONING, EXPRESSION, AND CHARACTERIZATION OF THE AUTHENTIC HYALURONAN SYNTHASE FROM GROUP C STREPTOCOCCUS EQUISIMILIS", Kumari and Weigel, J. Biol. Chem., 272(51): 32539-32546 (1997).	
dw	ii	"HYALURONAN SYNTHASES", Weigel et al., J. Biol. Chem., 272 (22): 13997-14000 (1997).	
dw	jj	"IDENTIFICATION AND MOLECULAR CLONING OF A UNIQUE HYALURONAN SYNTHASE FROM PASTEURELLA MULTOCIDA", DeAngelis et al., J. Biol. Chem., 273(14): 8454-8458 (1998).	
dw	kk	"THE CAPSULE BIOSYNTHETIC LOCUS OF PASTEURELLA MULTOCIDA A:1", Chung, et al. FEMS Microbiol. Lett. 15 September 1998, Vol. 166, No. 2, pages 289-296, entire document.	
dw	ll	"TRANSPOSON Tn916 INSERTIONAL MUTAGENESIS OF PASTEURELLA MULTOCIDA AND DIRECT SEQUENCING OF DISRUPTION SITE", Paul L. DeAngelis, Microbial Pathogenesis, 24: 203-209 (1998).	

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